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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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James E. Kaye

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06/16/2005

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EXAMINER

WONG, ALLEN C

ART UNIT

PAPER NUMBER

2613

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/837,496	KAYE ET AL.	
	Examiner	Art Unit	
	Allen Wong	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-92 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 69-92 is/are allowed.
- 6) ☒ Claim(s) 25-68 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 3/30/05 have been fully read and considered but they are not persuasive.

Regarding lines 4-6 and lines 13-18 on page 3 and of applicant remarks, applicant argues that Balakrishnan does not disclose "for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof". The examiner respectfully disagrees. As stated previously, in col.1, lines 43-59, frames or pictures with more spatially complex scenes require a boost in bit-rate transmission to transmit the detailed picture scene data with better quality than transmitting at a lower bit-rate and if the pictures have simple picture scene data, then a lower bit-rate transmission would be used to conserve bits. This technique is known as the recursive bit rate control scheme for adjusting the bit rate by utilizing the transmission buffer, and recursively check to see if the associated spatial activity is below the threshold, and if so, then the recursive bit rate control scheme will appropriately adjust the bit rate in a recursive manner. Thus, Balakrishnan discloses "for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof".

Regarding lines 22-23 on page 3 of applicant's remarks, applicant contends that Balakrishnan does not disclose any type of correlation between spatial and temporal activity. The examiner respectfully disagrees. In col.15, lines 19-20, Balakrishnan discloses a newly adjusted bit rate is determined through a series of calculations as disclosed in col.15. The bandwidth is allocated to meet the bit rate demand. Further, in col.1, ln.50-59, Balakrishnan discloses the bit rate demand depend on the quality of pictures that includes the picture spatial and temporal complexities. Thus, Balakrishnan discloses the correlation between spatial and temporal activity.

Regarding lines 10-11, 15-17 and 20-24 on page 4 of applicant's remarks, applicant asserts that the examiner misinterpreted Shen and that Shen does not disclose determining a brightness level and adjusting the initial bit rate demand thereof upwards when an associated brightness level is less than a lower threshold. The examiner respectfully disagrees. Shen discloses the determination of a luminance (luminance is equivalent to brightness) energy in P or B picture macroblocks and then decide whether or not interframe or intraframe coding should be performed, as disclosed in col.16, lines 37-46. Shen discloses that if a picture has less luminance energy, then intraframe coding will be performed and thus intracoding requires a higher bit-rate to encode, as disclosed in col.16, lines 44-46. Thus, Shen discloses the adjustment of the initial bit rate demand in an according manner dependent on the brightness level. Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Balakrishnan and Shen, as a whole, for recognizing that by determining low brightness level in a picture, a higher encoding bit rate is needed so as

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to improve picture quality during compression for preservation of picture detail, as disclosed in col.3, lines 18-41.

Regarding lines 3-7 on page 5 of applicant's remarks, applicant states that Shen does not cure the deficiencies of Balakrishnan. The examiner respectfully disagrees. See the above paragraph. Shen does meet the deficiencies of Balakrishnan. It would have been obvious to one of ordinary skill in the art to combine the teachings of Balakrishnan and Shen, as a whole, for recognizing that by determining low brightness level in a picture, a higher encoding bit rate is needed so as to improve picture quality during compression for preservation of picture detail, as disclosed in col.3, lines 18-41.

In conclusion, all of the broad limitations of the claims are met, and thus, the rejection is maintained.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 25-29, 31, 32, 36-40, 42 and 43 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Balakrishnan (5,793,425).

Regarding claims 25 and 36, Balakrishnan discloses a method for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising the steps of:

processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof (fig. 1, note that there are multiple channels with multiple encoders, and inside the encoder element 22 are a pre-processing unit to process video data as shown in fig.2, element 23);

determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity (col.15, lines 19-20; note a newly adjusted bit rate is determined through a series of calculations as disclosed in col.15, and in that the bandwidth is allocated to meet the bit rate demand; and col.1, lines 50-59; note "complexity" is equivalent to the term "activity");

for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof (col.1, lines 43-59; note that pictures with more spatially complex scenes need an increase in bit-rate transmission to transmit the detailed

scenes with better quality than transmitting at a lower bit-rate and if the pictures have simple scenes, then a lower bit-rate transmission would be used to conserve bits).

Note claims 26-29, 31, 32, 37-40, 42 and 43 have similar corresponding elements.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 30 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425) in view of Paik (5,321,725).

Balakrishnan does not disclose the determination of a quantization level of at least one previous picture. However, Paik does teach the feature of determining a quantization level of at least one previous picture (col.15, lines 42-49). It would have been obvious to one of ordinary skill in the art to determine a quantization level of at least one previous picture for improving picture quality during compression.

Claims 33 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425) in view of Fling (4,630,098).

As for claims 33 and 44, Balakrishnan does not disclose the adjustment of bit-rate based on horizontal pixel resolution. Fling teaches the concept of increasing the line-rate for improving the resolution of picture since there were visible horizontal line structures, and by increasing the line-rate, thus the horizontal resolution of the picture is

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improved because the horizontal line structures becomes less visible. (col.4, lines 39-50). Although Balakrishnan does not use the specific terms "pixel" and "bit," it is well known that pixel and bits form a line and eventually pictures are formed from lines and pixels. It is obvious to one of ordinary skill in the art to use Fling's concept of increasing horizontal line-rate for horizontal pixel resolution so that the picture accuracy is preserved during compression.

Claims 34, 45, 47-52, 54, 55, 57-63, 65, 66 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425) in view of Shen (5,862,140).

Regarding claims 34, 45, 47 and 58, Balakrishnan discloses a method for determining a bit rate need of a plurality of variable rate video channels in a video encoder, comprising the steps of:

processing video data from a current picture in each respective channel to determine at least a spatial activity and a temporal activity thereof (fig. 1, note that there are multiple channels with multiple encoders, and inside the encoder element 22 are a pre-processing unit to process video data as shown in fig.2, element 23);

determining an initial bit rate demand for each current picture according to the associated spatial activity and temporal activity (col.15, lines 19-20; note a newly adjusted bit rate is determined through a series of calculations as disclosed in col.15, and in that the bandwidth is allocated to meet the bit rate demand; and col.1, lines 50-59; note "complexity" is equivalent to the term "activity"); and

for at least one current picture, determining whether the associated spatial activity is below a lower threshold, and if so, increasing the associated temporal activity thereof, and adjusting the initial bit rate demand thereof according to the increased temporal activity thereof (col.1, lines 43-59; note that pictures with more spatially complex scenes need an increase in bit-rate transmission to transmit the detailed scenes with better quality than transmitting at a lower bit-rate and if the pictures have simple scenes, then a lower bit-rate transmission would be used to conserve bits).

Balakrishnan does not specifically disclose determining a brightness level and adjusting the initial bit rate demand thereof upwards when an associated brightness level is less than a lower threshold. However, Shen discloses the determination of a luminance (luminance is equivalent to brightness) energy in P or B picture macroblocks and then decide whether or not interframe or intraframe coding should be performed (col.16, lines 37-46). Shen discloses that if a picture has less luminance energy, then intraframe coding will be performed and thus intracoding requires a higher bit-rate to encode (col.16, lines 44-46). Thus, Shen discloses the adjustment of the initial bit rate demand in an according manner dependent on the brightness level. Therefore, one of ordinary skill in the art would obviously recognize that by determining low brightness level in a picture, a higher encoding bit rate is needed to improve picture quality during compression for preservation of picture detail.

Note claims 48-52, 54, 55, 59-63, 65 and 66 have similar corresponding elements.

Regarding claims 57 and 68, the Examiner takes Official Notice because it is well known to one of ordinary skilled for multiplexers to prioritize and allocate bandwidth based on priorities.

Claims 35 and 46 rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425).

Regarding claims 35 and 46, the Examiner takes Official Notice because it is well known to one of ordinary skilled for multiplexers to prioritize and allocate bandwidth based on priorities.

Claims 53 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425), Shen (5,862,140) in view of Paik (5,321,725).

Balakrishnan and Shen do not disclose the determination of a quantization level of at least one previous picture. However, Paik does teach the feature of determining a quantization level of at least one previous picture (col.15, lines 42-49). It would have been obvious to one of ordinary skill in the art to determine a quantization level of at least one previous picture for improving picture quality during compression.

Claims 56 and 67 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balakrishnan (5,793,425), Shen (5,862,140) in view of Fling (4,630,098).

Balakrishnan and Shen do not disclose the adjustment of bit-rate based on horizontal pixel resolution. Fling teaches the concept of increasing the line-rate for improving the resolution of picture since there were visible horizontal line structures, and by increasing the line-rate, thus the horizontal resolution of the picture is improved because the horizontal line structures becomes less visible. (col.4, lines 39-50).

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Although Balakrishnan does not use the specific terms "pixel" and "bit," it is well known that pixel and bits form a line and eventually pictures are formed from lines and pixels. It is obvious to one of ordinary skill in the art to use Fling's concept of increasing horizontal line-rate for horizontal pixel resolution in combination with Balakrishnan and Shen so that the picture accuracy is preserved during compression.

Allowable Subject Matter

1. Claims 69-92 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not specifically disclose limitations, "determining, in an initial iteration, an initial allocated bit rate for each current picture according to a ratio of the bit rate demand thereof to a sum of the bit rate demands from each current picture; determining a bit rate surplus or deficit between the overall available bit rate and a sum of the initial allocated bit rates; and adjusting, in at least one successive iteration, the initial allocated bit rate for at least some of the current pictures according to the surplus or deficit, and a ratio of bit rate demand thereof to a sum of the bit rate demands thereof", used in combination with all of the other limitations of claim 69. Similarly, claim 81 is patentable for the same reasons as claim 69.

Conclusion

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

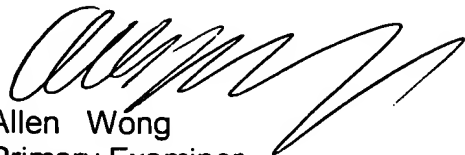
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Allen Wong
Primary Examiner
Art Unit 2613

AW

6/13/05